

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 14667PCTS	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/FI 2003/000871	International filing date (day/month/year) 14.11.2003	Priority date (day/month/year) 27.11.2002
International Patent Classification (IPC) or national classification and IPC D21G1/00, D21H19/00		
Applicant Metso paper inc. et al		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

a. ☒ (sent to the applicant and to the International Bureau) a total of 4 sheets, as follows:

☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the report
<input type="checkbox"/>	Box No. II	Priority
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/>	Box No. VI	Certain documents cited
<input type="checkbox"/>	Box No. VII	Certain defects in the international application
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application

Date of submission of the demand 13.05.2004	Date of completion of this report 19.01.2005
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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FI 2003/000871

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This report is based on a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
 - ☐ the international application as originally filed/furnished
 - ☒ the description:
 - pages 1-10 _____ as originally filed/furnished
 - pages* _____ received by this Authority on _____
 - pages* _____ received by this Authority on _____
 - ☒ the claims:
 - pages _____ as originally filed/furnished
 - pages* _____ as amended (together with any statement) under Article 19
 - pages* 11-14 received by this Authority on 12-10-2004
 - pages* _____ received by this Authority on _____
 - ☒ the drawings:
 - pages 1-3 _____ as originally filed/furnished
 - pages* _____ received by this Authority on _____
 - pages* _____ received by this Authority on _____
 - ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
 - ☐ the description, pages _____
 - ☐ the claims, Nos. _____
 - ☐ the drawings, sheets/figs _____
 - ☐ the sequence listing (*specify*): _____
 - ☐ any table(s) related to the sequence listing (*specify*): _____
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - ☐ the description, pages _____
 - ☐ the claims, Nos. _____
 - ☐ the drawings, sheets/figs _____
 - ☐ the sequence listing (*specify*): _____
 - ☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FI 2003/000871

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-16</u>	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	<u>1-16</u>	NO
Industrial applicability (IA)	Claims	<u>1-16</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

The object of the invention concerns a coated boxboard product with high gloss, stiffness and lesser-than-before consumption of material and to avoid bottlenecks and improve runnability with a method of the invention.

The following documents are cited in the International Search Report:

D1: WO 9967462 A1

D2: US 6164198 A

D1 reveals a method and an arrangement for calendering paper and board before and after coating. D1 does not indicate that a Yankee cylinder or a wet-stack calender is used. In the process for manufacturing coated board or paper, the web is finished by calendering at least such that the calendering which takes place prior to the coating step, i. e. the so called pre-calendering, is performed in a long-nip calender where the web is taken to a pressing zone formed by the belt and the backing roll. A web thus precalendered, then, is characterized by good surface smoothness while its flexural strength remains almost at its initial level. When the web surface is smooth and sealed prior to the coating step, the amount of coating mix applied can be essentially reduced or, correspondingly, the printability of the end product can be improved. The top side and/or both sides of the web surface is/are coated one or more times. (See abstract; page 5, line 32- page 6, line 2; page 7, lines 1-10 and page 8, lines 16-19.)

D2 shows a calendering method and a calender for producing paper or paperboard. The calender device comprises a fixed support element, a flexible jacket surrounding the stationary support beam, a heated counter element, a load element and a drive mechanism. (See abstract; column 2, lines 51-51 and claim 1.)

.../...

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: V

The invention according to claims 1, 5-11 and 15 differs from D1 by the fact that a specific board (boxboard with a middle ply material chosen from one or several material groups known in the art) is produced using a specific long-nip calender (see D2) and that a number of parameters concerning certain properties of the material of the manufactured coated board product are specified within certain intervals. (D1 does not state any parameters.)

However, since D2 describes a calender that can produce a web with a smooth surface and relative large thickness, (See column 1, lines 19-31), which is the object of the invention according to D1, it is considered to be obvious to a person skilled in the art to use a calender according to D2 in the process according to D1 for manufacturing a coated board product (for example a boxboard product). The produced coated board product would in all likelihood have material properties within the specified intervals of basis weight and surface properties as in claims 1, 5-11 and 15.

Consequently, claims 1, 5-11 and 15 lack an inventive step.

D1 discloses that: "Board and paper are coated in the same fashion on both sides, but e. g. when manufacturing packing board, it may be necessary to coat only one side of the web or to prepare a different coat for each side of the web." (See page 8, lines 16-19.)

Accordingly, claims 2-4 lack an inventive step.

The precalendering according to D1 involves the use of surface wetting. (See page 6, lines 14-21.)

Consequently, claims 13 and 16 lack an inventive step.

Dependent claims 2, 12 and 14 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, involve an inventive step, since said features fall within the scope of the customary practice followed by persons skilled in the art.

Accordingly, claims 2, 12 and 14 lack an inventive step.

Consequently, the invention according to claim 1-16 is novel but is not considered to involve an inventive step. The invention is industrially applicable.

Claims (Amended)

1. A coated boxboard product, which has two or more fiber plies and whose outside plies consist of bleached chemical pulp and filler plies of mechanical pulp and/or broke, and which board has a basis weight of 150-400 g/m², said board having a top side and a back side, wherein the boxboard product is manufactured without using a Yankee cylinder, the production of said product involving the use of a surface conditioning device functioning as a precalender and comprising:
 - 5 a fixed support element (14),
 - 10 a flexible jacket (12) fitted around the fixed support element (14), such that a board web (80) travels between the jacket (12) and a counter-roll (22), a load element (18, 22) provided in connection with the support element (14), such that the flexible jacket (12) is applied by the load element (18, 22)
 - 15 against the heatable counter-roll (22), the board web (80) present between the jacket (12) and the counter-roll (22) becoming calendered, at least one end wall mounted at the end of the flexible jacket in such a way that the flexible jacket (12) is attached to an end wall (24, 26) and the jacket (12) is rotated along with the end wall (24, 26) by means of a drive mechanism,
 - 20 **characterized** in that the middle ply material consists of one or more materials in the following group: groundwood (GW), pressure groundwood (PGW), chemithermo-mechanical pulp (CTMP), and broke; that the coated product has surface properties on the top side of the board as follows:

PPSs10 roughness (ISO 8791-4)	0,5-2,0 µm
Hunter gloss (ISO/DIS8254)	~35-80%,
 - 25 and said product having a density (SCAN-P7:75) within the range of 500-1000 kg/m³.
2. A product as set forth in claim 1, **characterized** in that the top side is
30 coated one or more times.

3. A product as set forth in claim 1 or 2, **characterized** in that the back side is uncoated.
4. A product as set forth in claim 1 or 2, **characterized** in that the back side is coated at least once.
5. A product as set forth in any of the preceding claims, **characterized** in that the basis weight is within the range of 180-350 g/m².
- 10 6. A product as set forth in any of claims 1-4, **characterized** in that the basis weight is within the range of 180-300 g/m².
- 15 7. A product as set forth in any of claims 1-6, **characterized** in that the top side has a Bendtsen roughness (SCAN-P21:67) within the range of 0-50 ml/min.
- 20 8. A product as set forth in any of claims 1-6, **characterized** in that the top side has a Bendtsen roughness (SCAN-P21:67) within the range of 0-20 ml/min.
9. A product as set forth in any of claims 1-8, **characterized** in that the top side has a PPSs10 roughness (ISO 87911-4) within the range of 0,8-1,5 µm.
- 25 10. A product as set forth in any of claims 1-9, **characterized** in that the top side has a Hunter gloss (ISO/DIS 8254) within the range of 40-65%.
11. A product as set forth in any of the preceding claims, **characterized** in that it has a density (SCAN-P7:75) within the range of 750-1000 kg/m³.

12. A product as set forth in any of claims 1-11, **characterized** in that the product calendering has also involved the use of a single- or multi-nip machine and/or soft calender.

5 13. A product as set forth in any of claims 1-12, **characterized** in that its precalendering has involved the use of board surface wetting.

14. A product as set forth in any of claims 1-12, **characterized** in that its precalendering has not involved the use of board surface wetting.

10

15. A method for making a coated boxboard product, said board product having two or more plies of fiber and having its outside plies consisting of bleached chemical pulp and middle plies of mechanical pulp and/or broke, and said board having a basis weight of 150-400 g/m², the boxboard product
15 being manufactured without using a Yankee cylinder, **characterized** in that the middle ply material consists of one or more materials in the following group: groundwood (GW), pressure groundwood (PGW), chemithermo-mechanical pulp (CTMP), and broke; and that in the method a web to be coated is introduced for precalendering into a surface conditioning device,
20 comprising:
a fixed support element (14),
a flexible jacket (12) fitted around the fixed support element (14), such that a board web (80) travels between the jacket (12) and a counter-roll (22),
a load element (18, 22) provided in connection with the support element
25 (14), such that the flexible jacket (12) is applied by the load element (18, 22) against the heatable counter-roll (22), the board web (80) present between the jacket (12) and the counter-roll (22) becoming calendered, at least one end wall of the calendering device mounted on the end of the flexible jacket in such a way that the flexible jacket (12) is attached to an end wall (24, 26)
30 and the jacket (12) is rotated along with the end wall (24, 26) by means of a

drive mechanism and the web is precalendered with said surface conditioning device.

16. A method as set forth in claim 15, **characterized** in that the precalendering involves the use of surface wetting.